wherein dΔn is in the range of 0.29-0.36μm, where d is the thickness of said liquid crystal layer, and Δn is the refractive anisotropy of the liquid crystal molecule; and

wherein a variation of light transmittance according to dΔn is less than about 60%.

REMARKS

At the outset, the Examiner is thanked for the thorough review and consideration of the subject application. The Final Office Action of February 13, 2002 has been received and contents carefully reviewed.

In the Final Office Action dated February 13, 2002, claims 1-3, 5, 8, 9, 12-14, 16, 19, 20, and 23-27 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Applicant's Figures (AF) 1A-1B in view of Ohe et al. (U.S. Pat. No. 5,910,271). The Examiner rejected claims 4, 6, 7, 10, 11, 15, 17, 18, 21, and 22 under 35 U.S.C. §103(a) as being unpatentable over Applicant's Figures (AF) 1A-1B and Ohe et al. (U.S. Pat. No. 5,910,271) and further in view of Kang et al. (U.S. Patent No. 5,464,669). The rejection of these claims under 35 U.S.C. §103(a) is respectfully traversed and reconsideration is requested.

Applicant respectfully submits that all claims are allowable over the cited references in that all claims recite in varying degrees of specificity, a combination of features including the common line and the data bus lines having a crossing relationship and dΔn in the range of 0.29-0.36μm and a variation of light transmittance according to dΔn is less than about 60%. Applicant respectfully submits that none of the cited references, singly or combined, teaches or suggests at least these features of the present invention. The dΔn range of 0.29-0.36μm is specific to the particular structure of the in-plane switching mode LCD as claimed. Reducing

the lower limit of the range to 0.29 μm provided greater than expected results, including the prevention of white color-shift.

Applicant submits that Ohe et al. does not show such a specific structure of the claimed invention and the combination with AF is not based on proper motivating factors. Applicant respectfully submits that such combination is at best an obvious to try, which is not sufficient to combine references. Applicant submits that none of the cited references, including Ohe et al., AF, or Kang et al., singly or in combination, teaches or suggests all of the features of the claimed invention.

Applicants believe the foregoing amendments place the application in condition for allowance and early, favorable action is respectfully solicited. Should the Examiner deem that a telephone conference would further the prosecution of this application, the Examiner is invited to call the undersigned attorney at (202) 624-1200.

If these papers are not considered timely filed by the Patent and Trademark Office, then a petition is hereby made under 37 C.F.R. § 1.136. Please credit any overpayment to deposit Account No. 50-0911.

Respectfully submitted,

LONG ALDRIDGE & NORMAN, LLP

Date: May 13, 2002

By _____
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MARKED-UP VERSION SHOWING CLAIM AMENDMENTS

1. (Amended) An in-plane switching mode liquid crystal display device comprising:

first and second substrates;

a plurality of gate and data bus lines defining pixel regions and arranged on the first substrate;

a common line in the pixel region, the common line and the data bus lines having a crossing relationship;

a pair of first and second electrodes parallel to each other applying plane electric fields in the pixel regions; and

a liquid crystal layer between the first and second substrates;

wherein $d\Delta n$ is in the range of 0.29-0.36μm, where d is the thickness of the liquid crystal layer, and Δn is the refractive anisotropy of the liquid crystal molecule; and

wherein a variation of light transmittance according to $d\Delta n$ is less than about 60%.

12. (Amended) A method of making an in-plane switching mode liquid crystal display device having first and second substrates, the method comprising [the steps of]:

forming a plurality of gate and data bus lines defining pixel regions and arranged on the first substrate;

forming a common line in the pixel region, the common line and the data bus lines having a crossing relationship;

forming a pair of first and second electrodes parallel to each other applying plane electric fields in the pixel regions; and

forming a liquid crystal layer between the first and second substrates;

wherein $d\Delta n$ is in the range of 0.29-0.36μm, where d is the thickness of the liquid crystal layer, and Δn is the refractive anisotropy of the liquid crystal molecule; and

wherein a variation of light transmittance according to $d\Delta n$ is less than about 60%.

23. (Amended) An in-plane switching mode liquid crystal display device comprising:

first and second substrates;

a plurality of gate and data bus lines defining pixel regions and arranged on said first substrate;

a common line in said pixel regions, the common line and the data bus lines having a crossing relationship;

a data electrode and a common electrode parallel to each other applying plane electric fields in said pixel regions;

a liquid crystal layer between said first and second substrates;

a plurality of thin film transistors adjacent respective cross points of said gate and data bus lines, each of said plurality of thin film transistors including a gate electrode, a gate insulator, a semiconductor layer, and source and drain electrodes;

a passivation layer on said plurality of thin film transistors;

a first alignment layer on said passivation layer, said first alignment layer comprising one of polyamide, polyimide, SiO_2, polyvinylalcohol, polyamic acid, and photosensitive material;

a black matrix for preventing light from leaking around said plurality of thin film transistors, said gate bus line, and said data bus line;

a color filter layer on said second substrate;

a second alignment layer on said color filter layer, said second alignment layer comprising one of polyamide, polyimide, SiO_2, polyvinylalcohol, polyamic acid, and photosensitive material, said photosensitive material being selected from the group consisting of polyvinylcinnamate, polysiloxanecinnamate and cellulosecinnamate; and

wherein $d\Delta n$ is in the range of 0.29-0.36μm, where d is the thickness of said liquid crystal layer, and Δn is the refractive anisotropy of the liquid crystal molecule; and

wherein a variation of light transmittance according to $d\Delta n$ is less than about 60%.

24. (Amended) A method of making an in-plane switching mode liquid crystal display device having first and second substrates, the method comprising:

forming a plurality of gate and data bus lines defining pixel regions and arranged on the first substrate;

forming a common line in the pixel regions, the common line and the data bus lines having a crossing relationship;

forming a data electrode and a common electrode parallel to each other applying plane electric fields in the pixel regions;

forming a liquid crystal layer between the first and second substrates;

forming a plurality of thin film transistors adjacent respective cross points of said gate and data bus lines, each of the plurality of thin film transistors including a gate electrode, a gate insulator, a semiconductor layer, and source and drain electrodes;

forming a passivation layer on said plurality of thin film transistors;

forming a first alignment layer on said passivation layer, said first alignment layer comprising one of polyamide, polyimide, SiO_2, polyvinylalcohol, polyamic acid, and photosensitive material;

forming a black matrix for preventing light from leaking around said plurality of thin film transistors, said gate bus line, and said data bus line;

forming a color filter layer on said second substrate;

forming a second alignment layer on said color filter layer, said second alignment layer comprising one of polyamide, polyimide, polyvinylalcohol, polyamic acid, and photosensitive material, said photosensitive material being selected from the group consisting of polyvinylcinnamate, polysiloxanecinnamate and cellulosecinnamate; and

wherein $d\Delta n$ is in the range of 0.29-0.36μm, where d is the thickness of said liquid crystal layer, and Δn is the refractive anisotropy of the liquid crystal molecule; and

wherein a variation of light transmittance according to $d\Delta n$ is less than about 60%.